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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/726,281	11/30/2000	Uttam Shyamalindu Ghoshal	AUS920000350US1	3318

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[REDACTED] EXAMINER

KASENGE, CHARLES R

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

2125

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/726,281	GHOSHAL, UTTAM SHYAMALINDU	
	Examiner	Art Unit	
	Charles R Kasenge	2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-44 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-44 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.  
     If approved, corrected drawings are required in reply to this Office action.  
 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1.) Certified copies of the priority documents have been received.  
 2.) Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.  
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.  
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. 
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 9, 10, 19, 20, 21-23, 29, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer U.S. Patent 4,478,076 in view of Kenyon U.S. Patent 5,477,701 and Wu U.S. Patent 5,850,324. Bohrer discloses a method and apparatus of characterizing dielectric material (col. 3, lines 39-48) comprising: using a probe to measure heat flow through the probe (col. 4, lines 14-18) and controlling a heat flow through the probe to be substantially zero (col. 5, lines 16-20). Bohrer discloses the method further comprising: cooling a sensor to a temperature below ambient temperature (col. 4, lines 50-59); and applying a current to the magnetic head to warm the surface of the magnetic head until the heat flow through the probe is substantially zero (col. 4, lines 35-49). It is inherent in a temperature-measuring probe to comprise of a probe body, probe tip, and have temperature sensors at the probe tip. Bohrer does not expressly disclose calculating a thermal conductance of a dielectric material although he does mention the effects of thermal conductivity. Kenyon discloses calculating a thermal conductance of a dielectric material, which includes determining the thermal conductance based on the current, an ambient temperature, and a temperature of the magnetic head (col. 11, lines 45-61). Wu discloses a magnetic head containing dielectric material (col. 5, lines 18-30).

At the time the invention was made, it would have been obvious to use Bohrer's method of characterizing dielectric material with Kenyon's step of calculating a thermal conductance of dielectric material in a magnetic head. One of ordinary skill in the art would have been motivated to do this since Bohrer and Kenyon use their methods to characterize dielectric material and Wu discloses a magnetic head having dielectric material.

3. Claims 4, 5, 24, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, and Wu as applied to claim 1 and 22 above, and further in view of Iijima U.S. Patent 5,966,275. Although Wu discloses the magnetic head including a magnetoresistive sensor (abstract), Bohrer, Kenyon, and Wu do not expressly disclose the magnetic head including a giant magnetoresistive sensor. Iijima discloses the magnetic head including a giant magnetoresistive sensor (col. 1, lines 47-54)

At the time the invention was made, it would have been obvious to have the magnetic head include a giant magnetoresistive sensor instead of a magnetoresistive sensor. One of ordinary skill in the art would have been motivated to do this since Iijima discloses the giant magnetoresistive sensor having the advantage of being the most suitable for detecting extremely feeble magnetic signals.

4. Claims 6, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, and Wu as applied to claims 2 and 22 above, and further in view of Chow U.S. Patent 4,405,961. Bohrer, Kenyon, and Wu do not expressly disclose cooling the magnetic head using a thermoelectric cooler to cool magnetic shields in the magnetic head. Chow discloses cooling the magnetic head to a temperature below ambient temperature includes using a thermoelectric cooler to cool magnetic shields in the magnetic head (abstract).

Art Unit: 2125

At the time the invention was made, it would have been obvious to use Chow's thermoelectric cooler for a method and apparatus for characterizing dielectric material. One of ordinary skill in the art would have been motivated to do this since Bohrer discloses cooling the magnetic head and Chow discloses the method of cooling a magnetic head using a thermoelectric cooler.

5. Claims 7, 8, 27, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, Wu, and Chow as applied to claims 1 above, and further in view of Watanabe U.S. Patent 5,409,547. Bohrer, Kenyon, Wu, and Chow do not expressly disclose modeling thermoelectric characteristics of the magnetic head and controlling the cooling of the magnetic head based on the modeling. Watanabe discloses modeling thermoelectric characteristics of a magnetic head based on the thermal conductance (col. 4, lines 46-68) and controlling cooling of the magnetic head during operation based on the modeling of thermoelectric characteristics of the magnetic head (col. 18, lines 21-26).

At the time the invention was made, it would have been obvious to use Watanabe's thermoelectric cooler for a method of characterizing dielectric material. One of ordinary skill in the art would have been motivated to do this since Bohrer discloses cooling the magnetic head and Chow discloses the method of cooling the magnetic head using a thermoelectric cooler. Watanabe's thermoelectric cooler provides a substantial improvement in cooling performance and coefficient of performance (col. 3, lines 17-26).

6. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, Wu, Chow, and Watanabe as applied to claims 6 and 8 above, and further in view of Yamamoto U.S. Patent 6,128,160. Bohrer, Kenyon, Wu, and Watanabe do not expressly disclose

Art Unit: 2125

the magnetic head being a read/write head. Yamamoto discloses a read/write head being used as a magnetic head (col. 2, lines 22-27) and the read/write head including a giant magnetoresistive sensor (col. 1, lines 61-66)

At the time the invention was made, it would have been obvious to use a read/write head as a magnetic head. One of ordinary skill in the art would have been motivated to do this since a magnetic head is a type of read/write head.

7. Claims 31-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, Wu, Iijima, and Chow as applied to claims 1, 5, 8, above, and further in view of Watanabe U.S. Patent 5,409,547. Bohrer, Kenyon, Wu, Iijima, and Chow do not expressly disclose using a computer program product in a computer readable medium for characterizing dielectric material in a magnetic head. Watanabe discloses using a computer program (col. 3, lines 27-43).

At the time the invention was made, it would have been obvious to use a computer program to implement the method of characterizing dielectric material in a magnetic head. One of ordinary skill in the art would have been motivated to do this since computer programs are commonly used when performing functions such as calculating values and modeling characteristics.

8. Claims 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohrer, Kenyon, Wu, Iijima, Watanabe, and Chow as applied to claims 4, 21, and 31 above, and further in view of Furukawa U.S. Patent 6,167,095. Bohrer, Kenyon, Wu, Iijima, Watanabe, and Chow do not expressly disclose using a computer program product in a computer readable medium for

Art Unit: 2125

characterizing dielectric material in a magnetic head. Furukawa discloses determining a signal to noise ratio and a maximum bandwidth of a signal.

At the time the invention was made, it would have been obvious to determine a signal to noise ratio and maximum bandwidth for a GMR sensor of the magnetic head based on the thermal conductance of the dielectric material. One of ordinary skill in the art would have been motivated to do this since it is well known in the art that having a high signal to noise ratio is ideal for transmitting an accurate signal.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles R Kasenge whose telephone number is 703 305-8592. The examiner can normally be reached on Monday through Friday, 8:30 - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 703 308-0538. The fax phone numbers for the organization where this application or proceeding is assigned are 703 746-7239 for regular communications and 703 746-7239 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0538.



CK

March 3, 2003

LEO PICARD  
SUPERVISORY PATENT EXAMINER  
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